

2/2 011

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0124460

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A DISCUSSION WITH 12 REFS., FOLLOWED BY THE EXPTL. EVALUATION OF 4 WIDELY USED METHODS FOR THE DETN. OF CLOTH COLORS (D. NICKERSON, ET AL., 1944 AND 1950, G. WYSZECKI, 1963, S., ET AL., 1968). FACILITY: VSES. ZAOCH. INST. TEKST. LEGK-PROM., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC: 539.4:629.12

BELEN'KIV, L. M.

"On Normalizing the Crimping of Hull Sheathing"

V sb. Teor. i prakt. voprs. prochnosti i konstruktsii mor. sudov (Theoretical and Practical Problems of Strength and Design in Sea-Going Vessels--collection of works), Leningrad, "Transport", 1970, pp 121-130 (from RZh-Mekhanika, No 7, Jul 71, Abstract No 7V854)

Translation: A basis is given for normalization of crimping of the hull sheathing of industrial ships in flaw detection. Crimping is considered as the result of repeated loading of the sheathing by contact forces from fenders when the ships are moored at the home base in heavy seas. The deformed state of structural elements in the plastic stage of work of the material is analyzed. The material of the sheathing is rigid-plastic with linear reinforcement. Chain and bending stresses and deformations are taken into account. The results of experiments are presented to confirm the theoretical analysis. It is proposed that normalization be based on the resultant relative longitudinal extension from bending and chain forces. It is proposed that a system of permissible elongations be set up analogous to the system of permissible stresses. A numerical analysis is presented together with a comparison with experiments. Author's abstract.

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USSR

UDC 538.56:519.25

BELEN'KIV, M.S., MIRONOV, V.L.

"Diffraction Of Optical Radiation By A Mirror Disk In A Turbulent Atmosphere"

Kvantovaya elektronika (Quantum Electronics), Moscow, No 5(11), 1972, pp 38-45

Abstract: The problem is considered of the reflection from a mirror disk of a spherical wave passing a layer of turbulent atmosphere which is described by the Kolmogorov-Obukhov 2/3 law. The effect is studied of atmospheric turbulence on the magnitude of the average back scattering cross-section and its excess over the scattering cross section of a diffusely reflecting disk as a function of the intensity of turbulence at horizontal and inclined paths. It is shown that during an evaluation of the average power of a signal reflected by a diffraction target of large size, it is necessary to take into account the turbulent state of the atmosphere. This paper was reported at the First All-Union Symposium On The Propagation Of Laser Emission In The Atmosphere (Novosibirsk, July 1971). The authors thank V.I. Tatarsk, Yu. A. Kravtsov, A.I. Ion, and A.G. Vinograd for attention to the work and helpful discussion of the results obtained. 5 fig. 23 ref. Received by editors, 26 Sept. 1971.

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1/2 028

UNCLASSIFIED

PROCESSING DATE--11SEP70

TITLE--OXIDATION OF AMMONIA ON A BISMUTH MOLYBDENUM CATALYST -U- 3

AUTHOR--ALKHAZOV, T.G., ADZHAMOV, K.YU., LISOVSKIY, A.YE., BELENKIY, M.S.,
PORTYANKSIY, A.YE.

COUNTRY OF INFO--USSR

SOURCE--KINET. KATAL. 1970, 11(1) 123-9

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CATALYTIC OXIDATION, AMMONIA, NITROGEN, ACTIVATION ENERGY,
BISMUTH, MOLYBDENUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1989/0195

STEP NO--UR/0195/70/011/001/0123/0129

CIRC ACCESSION NO--AP0106851

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0106851

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE IR SPECTRA SHOW THAT N SUB2 O, NO, N SUB2, AND H SUB2 O ARE THE MAIN PRODUCTS OF THE CATALYTIC OXIDN. OF NH SUB3 ON A 1:2 BI, MO CATALYST. 70PERCENT OF THE NH SUB3 IS CONVERTED TO N AND THE REMAINING PART IS OXIDIZED TO THE MENTIONED PRODUCTS. THE ACTIVATION ENERGY OF NH SUB3 OXIDN. IS 11 KCAL-MOLE AND THE OXIDN. IS A 1.5 ORDER REACTION WITH RESPECT TO NH SUB3 CONCN.

UNCLASSIFIED

1/2 009

UNCLASSIFIED

PROCESSING DATE--23OCT70

TITLE--OXIDATIVE DEHYDROGENATION OF LOW MOLECULAR WEIGHT OLEFINS ON TIN
ANTIMONY OXIDE CATALYSTS -U-

AUTHOR--(04)-SEKUSHOVA, KH.Z., VARTANOV, A.A., ALKHAZOV, Y.G., BELENKIY,
M.S.

COUNTRY OF INFO--USSR

B

SOURCE--IZV. VYSSH. UCHEB. ZAVED., KHIM. KHIM. TEKHNOL. 1970, 13(1), 102-6

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--DEHYDROGENATION, CATALYST ACTIVITY, ANTIMONY COMPOUND, TIN
OXIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/1019

STEP NO--UR/0153/70/013/001/0102/0106

CTRC ACCESSION NO--AT0119886

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE—23OCT70

CIRC ACCESSION NO--AT0119886

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDIES OF THE ACTIVITY OF 13 SN-SB OXIDE CATALYSTS COVERING THE COMPLETE COMPN. RANGE, FOR THE OXIDATIVE DEHYDROGENATION, DEEP SEATED OXIDN., AND ISOMERIZATION OF C SUB4-5 OLEFIN MIXTS. IN PULSE AND FLOW SYSTEMS AT 350-450DEGREES, INDICATE THAT ACTIVITY IS PROPORTIONAL TO SP. SURFACE OF CATALYSTS, AND THAT MAX. ACTIVITY IS NOTED FOR CATALYSTS WITH 4:1 OR 9:1 ATOM RATION SN-SB. LITTLE ACTIVITY IS SHOWN BY SNO SUB2, AND LESS BY SB SUB2 O SUB4. THE CATALYSTS ARE PREPD. BY MIXING NITRATE SOLNS., SEPG. AND DRYING THE PPT., AND CALCINING 16 HR AT 850DEGREES. SP. SURFACE AREAS RANGED FROM 0.9-27.2 M PRIME2 PER G. THE ACTIVE CATALYST IS SN-SB SOMPD., WHICH IS AMORPHOUS TO X RAY EXAMN. INST. NEFTI KHIM. IM. AZIZBEKOVA, BAKU, USSR. FACILITY: AZERB.

UNCLASSIFIED

USSR

UDC 621.43.063.66.094.37

OSMANOV, M. O., SULTANOV, M. YU. and HELEN'KIV, M. S., Azerbaydzhan Institute of Petroleum and Chemistry imeni M. Azizbekov

"Effectiveness of the Use of Platinum, Palladium, and Copper-Chrome-Oxide Catalysts to Render Engine Exhaust Gases Harmless"

Moscow, Avtomobil'naya Promyshlennost', No 3, 1973, pp 13-14

Abstract: Experiments conducted on SHPK-2 platinum SHPK-0.5 palladium and AzIMYEFTEKHIM-670 copper-chrome-oxide catalysts for rendering engine gases harmless, developed in the USSR showed the following. Under conditions of a tenfold or greater oxygen excess Pt and Pd were highly effective, while a twofold to fivefold oxygen excess resulted in all three being highly effective. When the ratio of CO, H₂ and O₂ is approximately stoichiometric the copper-chrome-oxide was much more effective than the others, while if the O₂ concentration is lower than stoichiometric, only copper-chrome-oxide showed any effectiveness. After 10 hours of function using ethylated benzene Pt and Pd lost significant effectiveness, while the copper-chrome-oxide did not lose effectiveness after 50 hours.

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USSR

UDC 621.678.5.004.14-974

BELEN'KIT, M. V., Candidate of Technical Sciences, and BILIK, SH. M., Doctor of Technical Sciences (deceased)

"The Use of Polymer Materials of the Manufacture of Parts Working at Low Temperatures"

Moscow, Vestnik Mashinostroyeniya, No 6, June 1973, pp 39-41

Abstract: Results are presented of tests conducted with various polymers used for manufacturing bushings in the spring suspensions of locomotives operating under low-temperature conditions. Best results are obtained for kaproplast KSG, a composition consisting of phenol formaldehyde resin (35%), reinforced with chopped-up capron mesh (65%), with the addition of graphite (5%). The stress at which constrained elasticity begins to be manifested in this material changes from 180 kg/cm² at 22°C to 300 kg/cm² at -90°C. It acts as a good buffer for impact loads. Bushings made from this material, installed on locomotives operating on the Severnaya (Northern) Railroad, where the winter temperatures reached -40 to -50°C, provided reliable service for a two-year run of the locomotive (300,000 km). 3 figures.

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1/2 033 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--STRENGTH AND ANTIFRICTION PROPERTIES OF CERTAIN POLYMER MATERIALS

-U-

AUTHOR--(02)-BILIK, SH.I., BELENKIY, M.V.

B

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, VESTNIK MASHINOSTROYENIYA, NO 2, 1970, PP 37-39

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--FILLER, PHENOL FORMALDEHYDE RESIN, POLYAMIDE RESIN,
POLYFORMALDEHYDE, TEFLON, POLYMER PHYSICAL PROPERTY, PLASTIC MECHANICAL
PROPERTY, ANTIFRICTION MATERIAL, THERMAL EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3003/1866

STEP NO--UR/0122/70/000/002/0037/0039

CIRC ACCESSION NO--AP0130693

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0130693

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE AUTHORS STUDY THE EFFECT OF TEMPERATURE (FROM MINUS 100 TO PLUS 100DEGREES) ON THE PHYSICAL, MECHANICAL, AND ANTI-FRICTION PROPERTIES OF THERMOSETTING POLYMERS WITH VARIOUS FILLERS BASED ON PHENOL-FORMALDEHYDE RESIN AND THE THERMOPLASTICS (POLYCAPROAMIDE, POLYFORMALDEHYDE, AND TEFLON-4).

UNCLASSIFIED

Belen'kiy, S. Yu.

UOC: 614.21 (47471-517-1)
DEDICATED AID (ON THE FIFTY-FIRST ANNIVERSARY OF THE SOVIET-MONGOLIAN

[Article by S. Yu. Belen'kiy, S. I. Khongorbaatar (deceased); Moscow: Sovetskaya Zdravookhranenie, Russiia, No. 11, 1972, submitted 23 June 1972, pp. 7-17.]

FIFTY years ago, an agreement was signed between the Government of RSFSR and the Mongolian People's Government concerning establishment of friendly relations. The signing of this document was a concrete manifestation of the Leninist policies of the young Soviet government directed toward establishing equal friendly relations with all eastern countries. Since that time friendship between the Soviet and Mongolian people, developed with each year, it strengthened, and became a tradition, on the basis of selfless fraternal relations between the two socialist nations.

This agreement was of enormous significance to the victory of the Mongolian revolution, and it served as the start of close political, economic, and cultural collaboration between the Soviet Union and Mongolia.

In accordance with this agreement, the Soviet Union rendered considerable aid to the Mongolian People's Republic in the area of development of its public health.

In prerevolutionary Mongolian public health was practically absent. Mortality was very high. For precisely this reason the people's rule established in Mongolia on 11 July 1921, which attributed enormous significance to organization of health care in the republic, turned to the Soviet Government with the request to give assistance in organizing the foundation of public health.

Since 1923, the People's Commissariat of Health of RSFSR regularly sent medical expeditions to the Mongolian People's Republic (MRR) to render aid in organizing the sanitary condition of the country, detect social diseases, conduct physical examinations of the people. There are some interesting documents, descriptive of such expeditions that worked in Mongolia in 1923-1935.

*VIA 5-783
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- 83 -*

Industrial

USSR

DAVIDYANTS, G. P., BELEN'KIY, V. I., DAVIDYANTS, G. G., ALEKSEYEV, V. A.

"Device for Mining of Useful Minerals From Underwater Deposits"

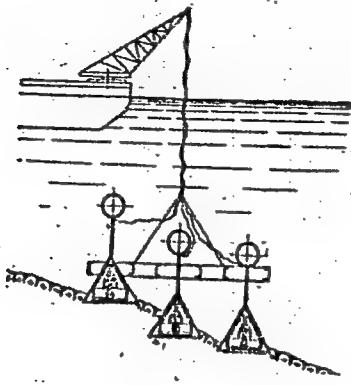
Otkrytiya Izobreteniya Promyshlennye Obraztsy Tovarnyye Znaki, No 5, 1972,
Patent No 359397.

Translation: A device for mining of useful minerals from underwater deposits, having magnetic susceptibility, including a frame, working organs with electromagnets and hollow spheres, differing in that in order to assure better contact of the working organs with the uneven surface of the bottom, the working organs are connected to the hollow spheres by means of lines passing through apertures in the frame.

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USSR

DAVIDYANTS, G. P., BELEN'KIY, V. I., ET. AL., Otkrytiya Izobreteniya
Promyshlennye Obraztsy Tovarnyye Znaki, No 5, 1972, Patent No 469497.



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USSR

UDC 539.4.019.3

BELEN'KIY, V. S., POSTNIKOV, V. S., and SHARSHAKOV, I. M.,
Voronezh

"Low-Temperature Internal Friction of Magnesium and Its Alloys
With Zirconium and Manganese"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 2, Mar-Apr 71,
pp 162-165

Abstract: The internal friction of single crystals and polycrystals of magnesium and the alloys Mg-0.83Mn, Mg-0.35Zr, and Mg-0.52%Zr were studied in the temperature range 83-298°K. The Q(T) curves of the deformed crystals show three peaks corresponding to temperatures of 150-188 and 250-260°K. The activation energy of the first two peaks is 0.31 and 0.47eV, respectively. It is assumed that these peaks results from the interaction of point defects with dislocations. The activation energy of the peak at 250-260°K is 1.32eV; the nature of this peak is related to relaxation of stresses at twinning boundaries.

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UDC 539.4.019.3

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USSR

BELEN'KIY, V. S., POSTNIKOV, V. S., and SHARSHAKOV, I. M.,
Voronezh

"Low-Temperature Internal Friction of Magnesium and Its Alloys
With Zirconium and Manganese"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 2, Mar-Apr 71,
pp 162-165

Abstract: The internal friction of single crystals and poly-crystals of magnesium and the alloys Mg-0.83Mn, Mg-0.35Zr, and Mg-0.52%Zr were studied in the temperature range 83-298°K. The Q(T) curves of the deformed crystals show three peaks corresponding to temperatures of 150-188 and 250-260°K. The activation energy of the first two peaks is 0.31 and 0.47eV, respectively. It is assumed that these peaks results from the interaction of point defects with dislocations. The activation energy of the peak at 250-260°K is 1.32eV; the nature of this peak is related to relaxation of stresses at twinning boundaries.

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USSR

UDC: 533.6.011.72

DORONIN, G. S., STUPNIKOV, V. P., ROMAN'KOV, V. V., BELENKIY,
V. Ya., ZASLAVSKIY, B. I., and BATSANOV, S. S.

"Compression of Plexiglass Cylinders by Glancing Detonation Waves"

Leningrad, Zhurnal tekhnicheskoy fiziki, No 5, 1973, pp 1059-1064

Abstract: This article pertains to the physical-chemical investigation of materials, subject to dynamic compression, which are kept in cylindrical containers under glancing detonation waves. Research of this type is now being intensively pursued. The purpose of this paper is to investigate the irregular reflection of shock waves in plexiglass cylinders under compression by glancing detonations, by a method suggested in an earlier article (G. A. Adadurov, et al, Fiz. gor. vzryva, vol 3, No 2, p 281, 1967). This method proposed using, as a model of the cylinder, plexiglass cylinders observed by high-speed photography to investigate the picture of the air flow through the fine, scintillating gaps between the plates composing the cylinders. A description is given of the explosive material used in the experiments and, briefly, of the experimental equipment. Results of the experiments are given in the form of curves of the change in velocity of the shock waves and 1/2

USSR

UDC: 533.6.011.72

DORONIN, G. S., et al, Zhurnal tekhnicheskoy fiziki, No 5, 1973,
pp 1059-1064

the relative dimensions of the main shock wave as functions of the cylinder length. A description of the picture of the phenomenon is given together with an explanation of the results as shown by the curves.

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USSR

UDC 621.373.43:621.382.3

BELEN'KIY, YAN YEFIMOVICH

"Transistorized Multiphase Relaxation Circuits"

Mnogofaznyye relaksatsionnyye skhemy na tranzistorakh (cf. English above),
Moscow, Izd. "Svyaz", 1972. 129 pp. ill. 46 ref. 50 kop.

Abstract: In the book, transistorized multiphase relaxation circuits (multiphase multivibrators and triggers) are considered in a wide frequency range, characterized by great economy with respect to the number of elements and the power required. The individual groups are studied of those circuits which operate in self-oscillatory, driven, and step regimes and also circuits combining some of the regimes mentioned. Methods are presented for the calculation of multiphase relaxation circuits and methods for control of them are described. The areas of application are indicated of the given class of circuits in systems for the formation of complex pulse signals in the processing of information, in the capacity of switching devices of wide application and also in the capacity of frequency converters. The book is intended for a wide circle of specialists in the field of communication, automatics and telemechanics, pulse techniques, radio engineering and computing techniques.

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USSR

BELEN'KIY, YAN YEFIMOVICH, Mnogofaznye relaksatsionnye skhemy na tranzistorakh,
Moscow, Izd. "Svyaz", 1972. 129 pp. ill. 46 ref. 50 kop.

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USSR

BELEN'KIY, YAN YEFIMOVICH, Mnogofaznyye relaksatsionnyye skhemy na tranzistorakh,
 Moscow, Izd. "Svyaz", 1972. 129 pp. ill. 46 ref. 50 kop.

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USSR

BELEN'KIY, YAN YEFIMOVICH, Mnogofaznyye relaksatsionnyye skhemy na tranzistorakh,
Moscow, Izd. "Svyaz', " 1972. 129 pp. ill. 46 ref. 50 kop.

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USSR

BELEN'KIY, YAN YEFIMOVICH, Mnogofaznyye relaksatsionnyye skhemy na tranzistorakh,
Moscow, Izd. "Svyaz', " 1972. 129 pp. ill. 46 ref. 50 kop.

Chapter 7. Use Of Multiphase Relaxation Generators In Pulse Measuring
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USSR

UDC 621.375.018.756

BELEN'KIY, YA. YE., LEVITSKIY, O. V., TISHCHENKO, A. G.

"Analysis of a Pulse Transformer Amplifier"

Otbor i peredacha inform. Resp. mezhved. sb. (Information Sorting and Transmission. Republic Interdepartmental Collection), 1970, vyp. 26, pp 96-101
(from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4D89)

Translation: A transistorized pulse device connected according to the scheme with a common base with the transformer coupling is analyzed. The possibility of excluding insignificant frequency-dependent parameters of the circuit is investigated in order to construct simplified circuit diagrams of the investigated amplifier for the operating frequency range. A method of series consideration of the frequency-dependent circuit parameters by subdividing the operating frequency range into zones inside which it is possible to neglect certain frequency-dependent parameters is proposed. Simple relations are obtained for the boundary frequencies of the zones, and the frequency zones are constructed by the proposed procedure for a specific amplifier circuit. The bibliography has 7 entries.

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USSR

UDC: 621.317.351:621.397

BELEN'KIY, Ya. Ye., MIKHALEVSKIY, V. I., TISHCHENKO, A. G., TSERKOVNYUK, E. A.

"A Device for Automatic Isolation of Television Signal Test Lines and Their Elements"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, No. 3, Jan 71, Author's Certificate No 291371, Division H, filed 15 Apr 69, published 6 Jan 71, p 161

Translation: This Author's Certificate introduces a device for automatically isolating the test lines of a television signal and their elements. The device contains a synchroselector, a selector of line and frame pulses, a line frequency pulse oscillator, a half-frame separation circuit, a switch for selecting the location of a line element, a cadence pulse generator and a flip-flop with separate triggering. As a distinguishing feature of the patent, the device is simplified and its operational reliability is improved by connecting two multiphase multivibrators in series through flip-flops with separate triggering between the selector of line and frame pulses and the switch for selecting the location of a line element. A signal from the line frequency pulse oscillator is sent to the inputs of these two multivibrators, and the cadence pulse generator is connected to the third multiphase multivibrator. The outputs of this third multivibrator are connected to coincidence circuits to which signals are sent from the line position selector switch.

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USSR

B

UDC 621.373.531.1

BELENKIY, YA. YE., TISHCHENKO, A. G.

"Multiphase Multivibrator with a Pulse Length Less than 100 Nanoseconds"

Otbor i peredacha inform. Resp. mezhved. sb. (Information Sorting and Transmission. Republic Interdepartmental Collection), 1970, vyp. 23, pp 72-77 (from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9G277)

Translation: This article contains a description of a multiphase multivibrator circuit with parallel inductive correlation made of transistors and operating in the nanosecond range. An analysis of the circuit diagram of the multiphase multivibrator in the flip stage is presented considering stray capacitances. The solution of the characteristic equation is found by the Lobachevskiy-Graffe-Dendelen method. From the minimum positive root condition, an expression is obtained for finding the magnitude of the corrective inductance. Simple relations are presented for calculating the basic circuit parameters and oscilloscopes of the pulses obtained. The bibliography has six entries.

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USSR

UDC: 621.373.531

BELEN'KIY, Ya. Ye., DYSSA, O. F., TISHCHENKO, A. G.

"Statistical Scatter of the Duration of Pulses From a Relaxation Oscillator with Common Emitter Coupling"

Otbor i peredacha inform. Resp. mazhved. sb. (Selection and Transmission of Information. Republic Interdepartmental Collection), 1970, vyp. 25, pp 117-122 (from RZh-Radiotekhnika, No 2, Feb 71, Abstract No 2G233)

Translation: The authors consider the possibility for mass production of a relaxation oscillator circuit with common emitter coupling. The scatter of duration values for pulses from the relaxation oscillator is determined by using deterministic and probabilistic methods of calculation. The functional relationship for the relative change in the output parameter as a function of the relative changes in individual circuit elements and the statistical characteristics of the circuit elements within the field of tolerance are used for the scatter characteristic. The deviation of the output parameter is presented in the form of statistical characteristics of random errors in circuit elements related by the functional relationship. Tolerances are distributed among the parameters of the individual circuit elements with regard to the corresponding influence functions. Bibliography of five titles. Resumé.

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USSR

UDC 534.21

BELEN'KIV, Ya. Ye. (L'yov)

"The Effect of the 'Water-Air' Interface on the Transmission of Amplitude and Frequency-Modulated Signals"

Kiev, Otbor i Peredacha Informatsii. Respublikanskiy Mezhvedomstvennyy Sbornik (Collection and Transmission of Information. Republic Interdepartmental Collection), Vypusk 25, "Naukova Dumka," 1970, pp 122-126

Abstract: When an information source is immersed slightly under water, reflections from the water-air interface contribute substantially to distortions of the signal. In this article, the effect of the water-air interface in a remote sound field of a point source located slightly under the surface of the water is investigated for both amplitude- and frequency-modulated signals. In the case of amplitude modulation, it was found that distortions from surface reflections can be avoided only when the frequency of the signal being transmitted is significantly less than that of the carrier signal. When a reflected signal from the water-air interface does occur, it gives rise to a parasitic frequency modulation that causes nonlinear distortions of the signal. In the case of

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USSR

UDC 534.21

BELEN'KIY, Ya.Ye., Kiev, Otbor i Peredacha Informatsii. Respublikanskiy Mezhvedomstvennyy Sbornik (Collection and Transmission of Information. Republic Interdepartmental Collection), Vypusk 25, "Naukova Dumka," 1970, pp 122-126

frequency modulation, an undistorted signal can be transmitted if the modulation index and the relative deviation of frequency are small -- otherwise, intensive parasitic amplitude modulation can occur.

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USSR

UDC: 681.142-523.8

BELEN'KIV, Ya. Ye., YERMAKOV, A. N., RAKOV, M. A., KMET', A. B., RAKOV, V. I., TISHCHENKO, A. G., TARASEVICH, V. A., Physicomechanical Institute of the Academy of Sciences of the Ukrainian SSR

"A Device for Discriminating and Computing Extrema"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 29, 1970, Soviet Patent No 281913, Class 42, filed 30 Jul 69, p 135

Abstract: This Author's Certificate introduces a device for discriminating and computing extrema in predetermined discrete zones. The unit contains an extremum-isolating flip-flop, a cadence pulse oscillator, a pulse distributor, and a counter. As a distinguishing feature of the patent, the functional possibilities of the device are extended by adding an analog-digital converter whose inputs are connected to the outputs of the cadence pulse oscillator and the pulse distributor, while the output of this converter is connected to the extremum-isolating flip-flop. Also incorporated into the device are two identical channels, each of them consisting of a flip-flop for determining the type of extremum and a coincidence matrix with one input connected to the output of the extremum-isolating flip-flop, and a coincidence matrix with one input connected to the output of the flip-flop for determining the type of extremum and the other connected to one of the outputs of 1/2

BELEN'KIY, Ya. Ye. et al., Soviet Patent No 281913

the analog-digital converter; the other inputs of the matrix are connected to the corresponding outputs of the pulse distributor. One of the outputs of the matrix is connected to the input of the flip-flop for determining the type of extremum, and the others are connected to the counters.

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USSR

B

UDC 621.373.531

BELENKIY, Ya. Ye., LEVITSKIY, O. Ye.

"Multiphase Relaxation Oscillator with Magnetic Couplings"

Otbor i peredacha inform. Resp. mezhved. sb. (Information Sorting and Transmission. Republic Interdepartmental Collection), 1970, vyp. 24, pp 107-111 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8G252)

Translation: The investigated multiphase relaxation oscillator consists of several transistor amplifying cascades with the transformer load included in a ring circuit and connected through a common base resistor. The processes are analyzed in the auto-oscillatory mode. The effect of the circuit and transistor parameters on the pulse length is investigated. The results of experimental testing are presented. The bibliography has seven entries.

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USSR

B

UDC 621.373.531.1(088.8)

BELEN'KIY, Ya. Ye.

"A Multiphase Slave Multivibrator"

USSR Author's Certificate No 255354, Filed 4 Apr 68, Published 12 Mar 70 (from
RZh-Radiotekhnika, No 10, Oct 70, Abstract No 10G180 P)

Translation: The author proposes a multiphase slave multivibrator with common-emitter coupling resistor and negative bias source. The negative bias is applied to the first stage. In order to make the pulse duration of each stage independent of the source of biasing voltage, the base of the first transistor in the multivibrator is connected to the voltage divider through a circuit consisting of a resistor and a semiconductor diode connected in series. The anode of this semiconductor diode is connected to the base of the first multivibrator transistor, while the cathode is connected to the collector of an auxiliary transistor whose base is connected to the collector of the first multivibrator transistor through a voltage divider resistor.

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USSR

B

UDC 621.396.961

BELENKLY, Ya. Ye., YEREMENKO, V. K., SPEKTOR, Yu. I.

"Error in Determining the Velocity Vector of Moving Objects in the Case of
Two-Point Direction Finding by the Doppler Effect"

Otbor i peredacha inform. Resp. mezhev. sb. (Information Sorting and Trans-
mission. Republic Interdepartmental Collection), 1970, vyp. 24, pp 130-125
(from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8G6)

Translation: This article contains an investigation of the problem of calculating the error in determination of velocity by the Doppler effect in the case of two-point direction finding with respect to a target. It is demonstrated graphically that when determining the velocity with a given error, doubling the measurement error of the angular coordinate leads to a sharp decrease in the region in which the radiated target is located. There are three illustrations and a two-entry bibliography.

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USSR

B

UDC 621.397:621.396.4

BELENKIY, Ya. Ye., MIKHALEVSKIY, V. I., TIDENKO, A. G., TSERKOVNYUK, E. A.

"Device for Automatic Supervision of Test Lines and Their Division into a Given Number of Intervals"

Otbor i peredacha inform. Resp. mezhved. sb. (Information Sorting and Transmission. Republic Interdepartmental Collection), 1970, vyp. 23, pp. 77-82 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8G220)

Translation: This article contains a description of an economical transistor unit permitting automatic separation of arbitrary TV signal line intervals and also separation of them into a given number of intervals. The pulse train generated by the unit realizes control of the transducers for shaping test signals of complex shape. The bibliography has three entries.

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1/2 018 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--AUTOMATIC CONTROL OF THE PARAMETERS OF OXYGEN CONVERTER MELTING -U-

AUTHOR--(05)--BEYTELMAN, L.S., BELENKIY, YU.YA., IZMAYLOV, G.A., YERMOLAYEV,
O.A., KULKOV, S.V.
COUNTRY OF INFO--USSR

B

SOURCE--STAL' 1970, 30(3), 225-8

DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, MECH., IND., CIVIL AND MARINE ENGR

TOPIC TAGS--METAL OXYGEN CONVERTER, METAL MELTING, AUTOMATIC CONTROL
SYSTEM, STEEL MANUFACTURE PROCESS

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1993

STEP NO--UR/0133/70/030/003/0225/0228

CIRC ACCESSION NO--AP0118952

UNCLASSIFIED

2/2 018

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0118952

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A SCHEME OF AN AUTOMATIC CONTROL IS PRESENTED, IN WHICH ALL MAJOR PARAMETERS OF BLOWING ARE CONTROLLED AS A FUNCTION OF GAS VOL. AND ITS CO SUB2 CONTENT. INDUSTRIAL TRIALS SHOWED THE VELOCITY AND ACCURACY OF THE SYSTEM SUFFICIENT FOR THE PRODUCTION OF THE DESIRED BLOWN METAL.

UNCLASSIFIED

USSR

BELENKOV, N., Meditsinskaya Gazeta, 16 August 1972, p 3

on emotional stress -- its mechanisms and consequences -- as an urgent problem of modern times.

Special notice was given to an experiment in which a conditioned reflex was developed in dolphins. After the dolphins learned to push on a lever to procure fish, they were observed to feed each other, one pressing on the lever for the other to eat. Further proof was also presented that not only certain areas of the brain perform various functions but also individual cells. The importance of the plastic properties of the brain in understanding the organization of its activity was stressed.

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USSR

UDC 621.316.721

AZAT'YAN, G.A., BELEN'KOV, N.M., YERMOSHIN, V.D., KOMAROV, L.I., KURNOSOV, A.I.

"Analysis Of Operation And Production Technology Of Current Regulator"

Elektron. tekhnika. Nauchno-tekhn. sb. Poluprovodn. pribory (Electronic Technology. Scientific-Technical Collection. Semiconductor Devices), 1970, Issue 3(53), pp 67-72 (from RZh--Elektronika i yeye primeneniye, No 1, January 1971, Abstract No 1B477)

Translation: The circuit is considered of a current regulating two-terminal network using transistors and semiconductor diodes, which is intended to be accomplished as a hybrid microcircuit. The production technology for the hybrid circuit is considered and its parameters are cited. 5 ill. 5 ref. S.D.

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USSR

UDC 612.821.6+612.825.2

BELENKOV, N. Yu., Chair of Physiology and Laboratory of Neurophysiology,
Medical Institute, Gor'kiy

"New Aspects of the Structural-Functional Organization of the Brain"

Moscow, Zhurnal Vyshey Nervnoy Deyatel'nosti imeni I. P. Pavlov, Vol 23,
No 2, Mar/Apr 73, pp 248-261

Abstract: Elaborate investigations in the physiology of behavior have failed to reveal specific centers responsible for specific actions. Therefore, a rational search for morphophysiological correlates of higher nervous activity should not concentrate on finding "locations of functions" but on elucidating the mobilization of individual neurons during implementation of a function. Having an unlimited possibility of self-organization, the brain operates on the basis of functional systems which program objectives or results to be achieved and which can mobilize all cerebral structures. Of the varicus degrees of freedom possessed by every neuron, only those degrees of freedom which optimally serve the programmed objective are engaged in a given activity. Further insight into behavioral physiology will be gained mainly through research on the level of the neuron and its synaptic and molecular processes. However, since higher nervous activity is not the result of the activity of individual neurons of their summated function but of the activity of well-established integrated

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USSR

EELENKOV, N. Yu., Zhurnal Vysshoy Nervnoy Deyatel'nosti imeni I. P. Pavlov,
Vol 23, No 2, Mar/Apr 73, pp 248-261

systems, this integrated organization should be the ultimate object of investigations.

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1/2 028 UNCLASSIFIED PROCESSING DATE--23OCT70
TITLE--INFLUENCE OF REVERSIBLE, COLD, FUNCTIONAL ELIMINATION OF THE
NEOCORTEX ON UNCONDITIONED AND CONDITIONED REFLEXES IN CATS -U-
AUTHOR--(02)-BELENKOV, N.YU., SOSENKOVA, V.A.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL VYSSHEY NERVNOY DEYATEL'NOSTI, 1970, VOL 20, NR 3, PP
512-518
DATE PUBLISHED-----70

B

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, BEHAVIORAL AND SOCIAL
SCIENCES

TOPIC TAGS--CEREBRAL CORTEX, COOLING, CONDITIONED REFLEX

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1997/1904

STEP NO--UR/0247/70/020/003/0512/0518

CIRC ACCESSION NO--AP0120563

UNCLASSIFIED

2/2 028

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NU--AP0120563

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CHANGES IN UNCONDITIONED AND
CONDITIONED ACTIVITY WERE STUDIED IN CATS BY MEANS OF REVERSIBLE COLD
FUNCTIONAL ELIMINATION OF THE GREATER PART OF THE NEOCortex.
FUNCTIONAL DECORTICATION LED TO CONSIDERABLE DISTURBANCE OF COMPLEX
UNCONDITIONED REFLEXES (POSTURAL, LOCOMOTION, ORIENTING REFLEXES,
ALIMENTARY AND DEFENSIVE REACTIONS). CONDITIONED REFLEXES COMPLETELY
DISAPPEARED. THE DISTURBANCES WERE OBSERVED DURING THE FIRST COLD
APPLICATIONS. AFTER FIVE TO SIX FUNCTIONAL DECORTICATIONS, THE
UNCONDITIONED AND CONDITIONED REFLEXES WERE GRADUALLY RESTORED, ALTHOUGH
NOT COMPLETELY. THE EXPERIMENTS REVEAL THE MAJOR ROLE PLAYED BY THE
NEOCortex IN THE TOTAL FUNCTION OF THE BRAIN, WHICH FORMS ANIMAL
BEHAVIOR UNDER NORMAL CONDITIONS, AS WELL AS THE POSSIBILITY OF
REORGANIZATION OF THE BRAIN ACTIVITY UPON SYSTEMATIC FUNCTIONAL
ELIMINATIONS OF THE CEREBRAL CORTEX. FACILITY: CHAIR OF
PHYSIOLOGY, KIROV MEDICAL INSTITUTE, GORKY.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--ON THE ROLE OF TEMPORAL AREAS OF THE NEOCORTEX IN THE INTERGRATION
OF BRAIN ACTIVITY -U-
AUTHOR--(02)-BELENKOV, N.YU., SHCHERBAKOV, V.I.

CCOUNTRY OF INFO--USSR

B

SOURCE--ZHURNAL VYSSHEY NERVOY DEYATEL'NOSTI, 1970, VOL 20, NR 2, PP
317-326

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--CEREBRAL CORTEX, CONDITIONE REFLEX, BRAIN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/1706

STEP NO--UR/0247/70/020/002/0317/0326

CIRC ACCESSION NO--AP0106446

UNCLASSIFIED

2/2 017

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0106446

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BILATERAL FUNCTIONAL ELIMINATION (COOLING) OF THE TEMPORAL AREAS OF THE CEREBRAL CORTEX IN CATS PRODUCES CONSIDERABLE CHANGES IN THEIR BEHAVIOUR. BOTH THE LOWER AND HIGHER NERVOUS ACTIVITY IS DISTURBED. THE PREVIOUSLY ELABORATED CONDITIONED REFLEXES DISAPPEAR. HOWEVER, SYSTEMATIC REVERSIBLE ELIMINATIONS OF THE TEMPORAL AREAS ARE FOLLOWED BY A GRADUAL RECOVERY OF INBORN AND ACQUIRED REACTIONS. THIS TESTIFIES TO A LARGE COMPENSATORY RESOURCES OF THE REST OF THE BRAIN AND ITS CAPACITY FOR A SUBSTANTIAL REORGANIZATION. THE DISAPPEARANCE OF ALIMENTARY CONDITIONED MOTOR REFLEXES IN THE FIRST EXPERIMENTS WITH THE COOLING OF THE TEMPORAL CORTEX SHOULD BE RELATED TO THE DISTURBANCE OF STIMULI DISCRIMINATION BY THE ANIMALS, I. E. DISTURBANCE OF THEIR ANALYTICAL AND SYNTHETIC ACTIVITY, OR AFFERENT SYNTHESIS. THE TEMPORAL AREAS OF THE NEOCORTEX PLAY A VERY IMPORTANT PART IN THE INTEGRATIVE ACTIVITY OF THE BRAIN. PERCEPTION OF AUDITORY INFORMATION IS BUT ONE OF THE ELEMENTS OF THEIR COMPLEX FUNCTION.

FACILITY: CHAIR OF PHYSIOLOGY AND LABORATORY OF NEUROPHYSIOLOGY, KIROV MEDICAL INSTITUTE, GORKY.

UNCLASSIFIED

USSR

UDC: 639.389.1:538.213:537.311.31:
669.15-194.56

BELENKOVA, M. M., UBAROV, A. I., MALUSHEV, K. A., MIKHEYEV, M. N.

"Change in Strength, Electrical and Magnetic Characteristics of Austenitic Steel Type 40Kh4G18F During Heat Treatment and Thermomechanical Treatment"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 36, No 5, Nov 73, pp 971-977.

Abstract: Type 40Kh4G18F aging austenitic steel is hardened by aging, cold and hot plastic deformation, both individually and together. All of the hardening treatments increase the yield point and magnetic permeability of the steel, but not to the same extent for different treatments. Electrical resistance changes more complexly. The greatest increase in magnetic permeability is observed upon cold plastic deformation, the least -- with combined treatment including aging and hot plastic deformation. However, with all hardening treatments the steel has a low value of magnetic permeability, and is therefore a good high-strength nonmagnetic material.

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Acc. Nr.:

MP0041209

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Ref. Code: UR0351

USSR

UDC: 620.179.14

BELENKOVA, M. M., MIKHEYEV, M. N., ZATSEPIN, N. N., VITKALOVA, R. N.,
and USTYUGOV, P. A.

"Using a Ferroprobe Method For Phase Analysis of Austenitic Steels"

Sverdlovsk, Defektoskopiya, No 6, 69, pp 77-82

Abstract: An improved technique is described for non-destructive monitoring of phase changes in ferromagnetic materials while under mechanical stress. The sensor is a localized ferroprobe which is applied to specific areas of a test specimen during stress, and whose response indicates changes in ferromagnetic phase. A schematic and parts list for the ferroprobe circuit are given, and its operation is explained in detail. A series of tests were made with the ferroprobe to examine changes from the austenitic state in a number of steel specimens that were subjected to tensile and bending stresses. Response was recorded as functions of stress concentration, rate of stress application, and specimen temperature. The gross long-term effect of stress was recorded in terms of change in shock toughness; test temperatures ranged

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from -100 to 80°C. The tests verify that the described ferroprobe technique gives an accurate picture of phase changes in steel elements as a result of mechanical deformation. Tensile stress causes a more severe austenitic destruction than does bending stress; also, the number of phase changes induced varies inversely with the applied rate of mechanical stress.

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USSR

UDC 537.521

BASOV, N. G., Academician, BELENOV, E. M., VOL'NOV, M. I., GUBIN, M. A., DANILEYKO, M. V., and NIKITIN, V. V., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR, Moscow

"On the Question of Generating a Stabilized, Ring-Resonator Laser Frequency"

Moscow, Doklady Akademii Nauk SSSR, Vol 210, No 2, 1973, pp 306-308

Abstract: The power resonances of a ring laser can be considerably narrower and more contrasting than in the case of a linear laser. They are based on more complex effects, and the coincidence of the center of the resonances with the central absorption frequency is not obvious. The article studies this question theoretically and experimentally. It is shown that, as in the case of a linear laser, the power resonances of a ring laser occur at the central frequency of the absorbing gas.

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USSR

UDC 537.521

ALEKSEYEV, V. A.; BASOV, N. G., Academician; BELENOV, E. M.; DANILEYKO, M. V.; VOL'NOV, M. I.; GUBIN, M. A.; NIKITIN, V. V.; TROSHAGIN, V. N.; P. N. Lebedev Physics Institute, Moscow

"Spectroscopy Inside a Uniform (Radiation) Line"

Moscow, Doklady Akademii Nauk SSSR, vol 207, No 6, 1972, pp 1306-1307

Abstract: A method is proposed and realized for finding the shift, 2Δ , between the spectral components of a line in the radiation of atoms or molecules, and in such cases when the 2Δ value is much less than the uniform or radiation width. The method is based on the concurrence of spatial and frequency attenuation effects of the medium in a ring laser. The dependence of the qualitatively different oscillation modes of the laser on the frequency difference Δ permits recording the presence of the Doppler broadening of the line for Δ by an amount much less than for the uniform width. It is found that, from the viewpoint of the accepted criterion of spectral line resolution, the sensitivity of the proposed method can be multiplied by 10^2 - 10^4 times. The theory of the method is developed, and an experiment for resolving the fine

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USSR

ALEKSEYEV, V. A., et al, Doklady Akademii Nauk SSSR, vol 207, No 6, 1972, pp 1306-1307

structure of the line, conducted with a laser containing a mixture of Ne²⁰ and Ne²², is described.

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Lasers and Masers

USSR

UDC 621.378.33

BASOV, N. G., BELENOV, E. M., DANIILYCHEV, V. A., and SUCHKOV, A. F.

"Pulsed CO₂-Laser With High Pressure of the Gas Mixture"

Moscow, Kvantovaya Elektronika, No 3, 1971, pp 121-122

Abstract: Short powerful pulses of coherent light are required for solving any number of physical problems. However, solid-state lasers are ordinarily used as the sources of powerful pulses. Theoretically, such pulses can be produced from gas lasers as well if the concentration of active particles in the gas is close to their concentration in solid-state lasers. It is certainly interesting to design gas lasers that operate with a high working gas pressure. Typical powerful CO₂-lasers operate at pressures of about 50 torr, and recently such lasers have been designed for operation at working mixture pressures up to 1 atm. However, the method of exciting gas lasers can not ensure uniformity in the active medium and is only slightly effective in the region of higher pressures. However, by raising the pressure to 1 atm, the authors were able to observe the spontaneous synchronization of the modes and to produce powerful ultrashort light pulses. The difficulties involved in exciting a gas-discharge laser were overcome by using an external source for ionizing the gas. The electric discharge was activated in a mixture of CO₂+N₂+H₂O+He

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USSR

BASOV, N. G., et al., *Kvantovaya Elektronika*, No 3, 1971, pp 121-122

placed between two flat electrodes. By further increasing the gas pressure, one can reduce the duration of the generation pulse and simultaneously increase the energy. Thus, with large pressures the self-synchronization of the modes may ensure the generation of ultrashort radiation pulses with a duration of about 10^{-11} seconds. The article contains 1 figure and 5 bibliographic entries.

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USSR

BASOV, N. G., BELENOV E. M., DANILYCHEV, V. A., KERIMOV, O. M., KOVSH, I. B., and SUCHKOV, A. F., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

"Gas Lasers at High Pressures"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 14,
No 7, 5 Oct 71, pp 421-426

Abstract: A gas laser, operating at pressures of tens of atmospheres and high-power, short-duration pulses is described. Its active part is excited by electrons from an ionizing radiation source, accelerated further by an electric field. Essential problems to be solved are: 1) mechanism of the introduction of energy, and 2) conditions of stability of operation not perturbed by quenching processes.

1) Power in the active part of the laser may be divided into two components: one due to the electron current, and another - to both ions and electrons. It was found that in normal operation, the former is several orders of magnitude larger than the latter. A set of partial differential equations is given, the solution of which establishes conditions for the avalanche gas ionization. It was also found that in normal operation the 1/3

USSR

BASOV, N. G., et al., Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 14, No 7, 5 Oct 71, pp 421-426

potential gradient along the discharge sector, including the cathode drop, was constant. Typical parameters of laser operation are given: with a pulse length of 2×10^{-8} sec, electron particle density 10^{15} cm^{-3} , the discharge specific energy is 3 to 4 joule cm^{-3} .

2) With the potential being larger than its breakdown value, volume discharge is stable during the spark generation period. Cases were examined for the potential difference being below that value. As with an increase of current, the temperature increases, leading to a decrease of pressure, and the breakdown conditions are reached. The dynamics of this type of perturbation is described by three partial differential equations, and computation of the energy needed to produce a discharge with the initial potential difference half the critical value is performed as an illustration. This type of relationship is used as a criterion of stability. Graphs are presented giving threshold voltage as a function of pressure for mixtures of $\text{CO}_2:\text{N}_2$ and of $\text{CO}_2:\text{N}_2:\text{He}$.

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USSR

BASOV, N. G., et al., Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 14, No 7, 5 Oct 71, pp 421-426

3) An experiment was performed with a molecular laser using CO₂ at 25 atmospheres, with electron bunches as triggers. It was found that quenching collisions produced little effect upon the population inversion in CO₂ at high pressure. It was found, however, that with an increase of pressure, the breakdown voltage increased across the discharge sector, and the specific energy input increased too. Increased collision frequency, accompanying the increase of pressure, reduces the generation pulse length.

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USSR

UDC 621.373:530.145.6

BASHKIN, A. S., BELENOV, E. M., GONCHUKOV, S. A., ORAYEVSKIY, A. N.,
PETROVSKIY, V. N., PROTSENKO, Ye. D.

"Stabilizing the Emission Frequency of a Gas Laser by the Method of Comparison With a Radio Frequency"

V sb. Kvant. elektronika (Quantum Electronics--collection of works),
No 2, Moscow, 1971, pp 40-48 (from RZh-Radiotekhnika, No 7, Jul 71,
Abstract No 7D117)

Translation: The authors study intermode spacing as a function of various laser parameters for a laser operating on a wavelength of 0.63 micron emitting three or two axial modes. It is proposed that certain properties of the frequency responses be used for stabilizing the emission frequency of a gas laser by the method of comparison of the intermode spacing with a radio frequency. A theoretical study is made of the resultant experimental data for the case of emission of three axial modes in the region of symmetric tuning. It is shown that a stabilized gas laser can be made with relatively long-term frequency stabilization, surpassing the results which have been achieved up to the present time. The absolute frequency stability of such a laser (in the case of high relative stability for long time intervals) will be determined by the

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USSR

BASHKIN, A. S., et al., Kvant. elektronika (Quantum Electronics--collection of works), No 2, Moscow, 1971, pp 40-48 (from RZh-Radiotekhnika, No 7, Jul 71, Abstract No 7D117)

shift in the center of the line of the atomic transition as a consequence of various factors. Six illustrations, bibliography of four titles.

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USSR

UDC 621.378.33.016.35

BASHKIN, A. S., BELENCY, E. M., GONCHUKOV, S. A., ORAYEVSKIY, A. I.,
PETROVSKIY, V. N., PROTSEKHO, Ye. D.

"Stabilizing the Frequency of Gas Laser Emission by the Method of Comparison With a Radio Frequency"

Moscow, Kvantovaya Elektronika, No 2, 1971, pp 40-49

Abstract: The authors study the intermode spacing as a function of various parameters of a laser on a wavelength of 0.63μ operating under conditions of emission of three or two axial modes. It is proposed that certain properties of the frequency characteristics be used to stabilize the emission frequency of a gas laser by the method of comparing the intermode spacing with a radio frequency. The resultant experimental data are theoretically studied for the case of emission of three axial modes in the region of symmetric tuning. It is shown how a stabilized gas laser can be made with a relative long-term frequency stability exceeding the results which have been attained up to the present time. The absolute frequency stability of such a laser (assuming high relative stability for long time intervals) will be determined by the displacement of the center of the line of the atomic transition due to various factors.

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Masers and Lasers

USSR

UDC: 621.373:530.145.6

BASOV, N. G., BELENOV, E. M., DANILEYKO, M. V., NIKITIN, V. V.

"Power Resonances and Frequency Stabilization of a Gas Laser With Nonlinear Absorption Cell"

V sb. Kvant. elektronika (Quantum Electronics--collection of works), No 1, Moscow, 1971, pp 42-52 (from RZh-Radiotekhnika, No 5, May 71, Abstract No 5D181)

Translation: The paper deals with the power resonances in gas laser emission due both to the effect of spectral line burnout (laser with a Fabry-Perot resonator) and to the interaction of modes at frequencies close to the centers of lines of amplification or absorption (laser with annular resonator). In the latter case, power resonances may be appreciably narrower and more contrasting than those in a laser with Fabry-Perot resonator. Data are given on stabilization of a helium-neon laser with Fabry-Perot resonator with respect to the peak of emission caused by saturation of methane absorption. Seven illustrations, bibliography of sixteen titles.

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USSR

UDC 621.378.33

BASOV, N. G., BELENOV, E. M., DANILEYKO, M. V., NIKITIN, V. V.

"Power Resonances and Frequency Stabilization of a Gas Laser With a Nonlinearly Absorbing Cell"

Moscow, Kvantovaya Elektronika, No. 1, 1971, pp 42-52

Abstract: Power resonances of a gas laser with a nonlinearly absorbing cell that are caused both by spectral effects (in a laser with a Fabry-Perot resonator) and by competition of spectral and spatial effects (in a laser with a ring resonator) are studied. The half-width of the power resonances of a laser with a Fabry-Perot resonator and a methane absorbing cell was of the order of 300 kHz. The half-width of resonances of a ring laser was ~30 kHz. The laser with a Fabry-Perot resonator and a methane cell stabilized at peak radiation displayed stability and a frequency generation equal to 10^{-11} . It is concluded that the use of power resonances of a ring laser as optical discriminators can raise the stability and generation of the radiation frequency by more than an order of 2.

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USSR

UDC 621.822.002.3:621.762

YAS', D. S., OSVETIMSKIY, L. A., DYADENKO, N. S., ZAPOROZHENETS, A. A., and BELENTSOVA, N. A., Ukrainian Scientific Research Institute of the Textile Industry

"Copper-Graphite Materials with Additives of Graphite Granules Plated with Copper"

Kiev, Poroshkovaya metallurgiya, No 5, May 71, pp 70-75

Abstract: A new method for improving the antifriction properties of materials intended for operation under conditions of dry friction, for manufacturing sliding contacts and low-load sliding bearings, developed at the metal ceramics laboratory of the Ukrainian Scientific Research Institute of the Textile Industry was applied to obtain metal ceramic of copper-graphite material with additives of graphite granules plated with copper. The results, presented in graphs and photographs of microstructure of copper-graphite materials with various graphite content, show that the addition of copper-plated graphite reduces the material electric conductivity and increases its compression strength, and with 6% content the hardness and bending strength increase. Thus, for a material with 15 wt% content of plated graphite, hardness and compression and bending strength increase by 30, 80, and 100%, respectively, while 1/2

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YAS', D. S., et al., Poroshkovaya metallurgiya, No 5, May 71, pp 70-75

the specific electric resistance and the dry friction coefficient decrease by 60 and 27%, respectively, in comparison with the same material with exposed graphite.

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USSR

UDC 539.4:[624.011.1+624.014]

BELENYA, YE. I., KUPALOV, K. K., SOBOLEV, YU. V.

"Finding an Efficient Prestressed Design for High Pressure Equipment with a Cylindrical Housing"

V sb. III Mezhdunar. konf. po predvarit. napryazhennym metal. konstruktsiyam. T. 2 (Third International Conference on Prestressed Metal Structural Elements, Vol 2--collection of works), pp 3-12 (from RZh-Mekhanika, No 11, Nov 71, Abstract No 11V920)

Translation: During 1969, research was performed at the Moscow Engineering Construction Institute imeni V. V. Kuybyshev to find an efficient design for equipment calculated for a rare combination of large size and high internal pressure. When comparing several versions of the housing design using high-strength materials with different shapes of the shell -- spherical, cylindrical with hemispherical bottoms, and so on -- it turned out that the most efficient in design respects and the most economical version is the one with a cylindrical housing prestressed by winding with high-strength wire with flat ribbed tops reinforced by rods.

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USSR

UDC 621.372.54:537.228.1

BELETSKAYA, G. A.

"Realization of Narrow Band Quartz Filters with a Lattice Structure"

Sb. nauchn. tr. Leningr. Fil. TsNII svyazi (Collected Scientific Works. Leningrad Branch of the Central Scientific Research Communications Institute), 1970, vyp. 4, pp 162-171 (from RZh-Radiotekhnika, No 4, Apr 71, Abstract No 4A165)

Translation: A study is made of the characteristic features of constructing symmetrical ladder type quartz filters by the narrow band reactance function. An algorithm is presented for expansion of the narrow band reactance function in a chain fraction. The conditions permitting the expansion in the case of a quartz filter are defined. An example calculation is presented.

1/1

BELETSINA, N. V.

biochemistry

Name: Zvezdin Research Institute, Pushchino

Description:

SECTION IV Sci. Subjective Research Institute
Proteins
PCS - 89
July 1971*(Signature)*(U) During this quarterly reporting period, two new articles were located from the Protein Research Institute at Pushchino. On the basis of one of the articles, which dealt with Escherichia coli ribosomes, it was possible to associate one new person, N. I. Smirnov, with the Institute (32). The other article, also on Escherichia coli, was issued jointly from the Institute of Genetics and Selection of Microorganisms, Moscow, and the Protein Research

Institute at Pushchino (33). Previous articles by V. I. Pernagorov have been issued from the former institute. No previous facility association could be located for V. D. Vasil'ev, but it is likely that he represents the latter institute. This article probably represents some joint work between the two institutes.

(U) As a ready source of reference, given below is a complete listing of personalities identified with the Protein Research Institute to the present time:

<u>Belotsina, N. V.</u>	<u>Privalov, P. I.</u>
<u>Berentsen, T. M.</u>	<u>Ptitsyn, O. B.</u>
<u>Chigazze, Yu. M.</u>	<u>Rashevskaya, Ya. P.</u>
<u>Fedorov, B. A.</u>	<u>Sorokin, I. N.</u>
<u>Finkevitschen, A. V.</u>	<u>Smirnov, N. I.</u>
<u>Glininskaya, O. V.</u>	<u>Spirin, A. S.</u>
<u>Lavrilova, L. P.</u>	<u>Tikhonov, Yu. I.</u>
<u>Mal'kova, N. V.</u>	
<u>Witkin, Yu. V.</u>	<u>Vasil'ev, V. D.</u>

INITIALS

10

CHEMICAL TRANSFORMATION

SINGLE-ELECTRON TRANSFER AND CHEMICAL TRANSFORMATIONS

(Conference in Rostov-on-Don)

[Article by Candidate of Chemical Sciences Z. V. Todes, Moscow, 107-108]

Dr. V. V.
Z. V. Todes

A conference on the role of electron transfers in chemical reactions was held in Rostov-on-Don on 22-25 May. It was organized by the Northern Caucasus Scientific Center of the Vostotn Akademii Nauk SSSR, Russian, No 9, September 1973, pp. 107-108.

Chemical reactions are usually regarded as the rupture and formation of bonds, that is, the rearrangement of the skeleton of a molecule. It is now considered, however, that the transfer of atoms or atomic arrangements is preceded by the transfer of electrons from one of the reacting molecules to the other. The study of hot-stage, which has become possible through the use of new instrumental methods of investigation, expands concepts of the reaction mechanism as a sequence of elementary stages known to us.

As a result of electron transfer new particles appear, not known in organic chemistry of the past. The properties of those products of the reaction are examined in a number of reports. Hemoglobin, myoglobin, cytochrome C and other enzymes with Fe(II) after electron transfer give nonequilibrium forms in which the iron has already gone over to the state Fe(II) but the protein part still retains it in a previous configuration (R. M. Davydov). The transformation of 4-nitro-4,4-dinitro-cis-stilbene into an anion-radical is accompanied by complete cis-trans-isomerization. Destruction of the symmetry of the molecule leads to establishment of equilibrium: 4-nitro-cis-stilbene in the presence of electron transfer gives a mixture

of anion-radicals of cis- and trans-stilbenes (Z. V. Todra). In the reports of S. P. Soloden'kov and N. I. Terekhova it was shown that the proportion of the products of electron transfer depends not only on the distribution of electrons over the molecule but also on the entry of those products into the composition of the ionic associates.

Yu. N. Gladkishev has established that the reaction of lithium or potassium with benzene or hexene substituted benzophenol, giving chlorohydrates of triethylgermyl-substituted benzene ketyl. In other words, in hexane, instead of the existing particle appears the tris(ethylgermyl) anion, which reacts further according to a scheme of single-electron transfer. Bimetallic organo compounds such as bis-(triethylgermyl)-mercury or bis-(triethylgermyl)-cadmium are capable of participating in electron transfer also in non-polar solvents of the type of benzene, if a sufficiently strong acceptor, for example tetracyanogen-ethylene, is used (Academi-

an. G. A. Razumov and G. A. Abotumov).

Yu. P. Kompel' and O. Yu. Okhlobystin revealed the general mechanism of the oxidation of organometallic compounds according to which a single electron is torn away from those derivatives and they simultaneously decompose into an organic radical and the cation of the metal. The radicals, if they do not react chemically, give off still another electron, being stabilized to carbocations. The reaction ends with the stage of action with molecules of the solvent. The establishment of such a mechanism explains the formation of the oxidation product of benzyl acetate on the main acetate in acetic acid. Aliphatic mercury chlorides by the same conditions give ethers of acetic acid, paraffins and olefins. The formation of hydrocarbons in that reaction also indicates the existence of radicals as intermediates of the oxidation.

The ability of organomercuric compounds to act as electron donors was shown on the example of reactions of diaryl mercuric compounds (S. A. Shevel'ev, I. P. Dotskaya, et al.). Upon reacting with nitronium fluoroborate in sulfolane, diaryl mercury gives an aromatic hydrocarbon and trinitromethyl-styrl mercury as the main product and a certain quantity of Al(OEt)₃. N. Kashin, T. P. Belotskaya, and V. I. Stavko, results agree with the hypothesis that in the first stage of the reaction the cation-radical of diaryl mercury and the radical $\cdot\text{NO}_2$ form. The latter forms through electron transfer either to the nitronium cation or to the tetranitromethane. The cation-radical of diaryl mercury decomposes, giving the highly reactive radical $\cdot\text{Ar}^+$. That radical reacts insignificantly with the lowly reactive

USSR

UDC 547.484.34

KURTS, A. L., MASIIS, A., BELETSKAYA, I. P., and REUTOV, O. A.,

"Reactivity of Ambident Anions. Selective Solvation of Acetoacetic Ester Anion in Alkylation Reactions"

Leningrad, Zhurnal Organicheskoy Khimii, Vol 7, No 11, Nov 71, pp 2233-2236

Abstract: Kinetics of the O-alkylation and C-alkylation of potassium enolate of the acetoacetic ester with ethyltosylate in a binary mixture hexamethyl-phosphotriamide-ethanol was studied. It was established that the reaction rate of both of these reactions increases with increasing quantity of the dipolar aprotic solvent in the mixture. It has been shown that when a change is made from alcohol to hexamethylphosphotriamide [hexametapol], the O-alkylation rate is increased 400-fold, while the C-alkylation is increased only about 25-fold. This is due to the selective solvation of the oxygen center of the anion with the proton containing solvent. Substituting deuteroethanol for ethanol is reflected only in overall reaction rate, the ratio of isomers remaining unchanged.

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1/2 008

UNCLASSIFIED

PROCESSING DATE--04DEC70

TITLE--ALKYLATION OF METAL ENOLATES OF ACETOACETIC ESTER -U-

AUTHOR--(02)-KURTS, A.L., BELETSKAYA, I.P.

COUNTRY OF INFO--USSR

B

SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (4), 831-5

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ALKYLATION, ACETOACETATE, METAL COMPOUND

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3006/1017

STEP NO--UR/0062/70/000/004/0831/0835

CIRC ACCESSION NO--AP0134729

UNCLASSIFIED

2/2 008

UNCLASSIFIED

PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0134729

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXAMN. OF LITERATURE DATA ON THE TITLE PROBLEM RESULTED IN THE CONCLUSION THAT THE RATIO OF O,ALKYLATION TO C,ALKYLATION OF ACETOACETIC ESTER IN THE FORM OF METALLIC ENOLATES CANNOT BE SATISFACTORILY EXPLAINED ON THE BASIS OF N. KORNBLUM'S RULES (1955, 1966). FACILITY: INST. ELEMENTOORG. SOEDIN., MOSCOW, USSR.

UNCLASSIFIED

1/2 013 UNCLASSIFIED PROCESSING DATE--20NOV70
TITLE--RADICAL EXCHANGE REACTIONS BETWEEN ORGANOMERCURY COMPOUNDS -U-

AUTHOR--(04)-BELETSKAYA, I.P., BUTIN, K.P., SHISHKIN, V.N., REUTOV, O.A.

CCNTRY CF INFO--USSR

SOURCE--J. ORGANOMETAL. CHEM. 1970, 23(1), 31-9.

DATE PUBLISHED----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--EXCHANGE REACTION, ORGANOMERCURY COMPOUND, NITRILE,
CHLORINATED ORGANIC COMPOUND, CHEMICAL REACTION RATE

CCNTRL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/2112

STEP NO--NE/0000/70/023/001/0031/0039

CIRC ACCESSION NO--AP0125656

UNCLASSIFIED

2/2 013 UNCLASSIFIED PROCESSING DATE--20NOV70
CIRC ACCESSION NO--AP0125696
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REACTIONS OF PH SUB2 HG WITH R
SUB2 HG (WHERE R EQUALS CN, CCL SUB3, C TRIPLE BOND CPH) IN DMF (STUDIED
BY A POLAROGRAPHIC METHOD) GAVE PHHGR, OBEDIING SECOND ORDER KINETICS.
ADON. OF IODIDE HAS NEGLIGIBLE EFFECT ON THE REACTION RATES. WHEN R
EQUALS CFCCLC SUB2 ET, CF SUB2 CO SUB2 ET, CH SUB2 CO SUB2 ME, OR PHCH
SUB2 THE REACTION OF PH SUB2 HG WITH R SUB2 HG DOES NOT OCCUR. P,OME
GROUPS IN THE DIPHENYLMERCURY INCREASE THE REACTION RATES. THE RESULTS
OBTAINED ARE DISCUSSED IN TERMS OF AN S SUB2 MECHANISM.
FACILITY: DEP. CHEM., MOSCOW STATE UNIV., MOSCOW, USSR.

UNCLASSIFIED

USSR

ALEKSIDZE, N. G., MESHVELISHVILI, D. F., and BELETSKAYA, R. P., Tbilisi State University

"The Effect of Transamine on Monoamineoxidase Activity and Psychoneurologic Behavior of Rats in a Labyrinth"

Tbilisi, Soobshcheniya Akademii Nauk Gruzinskoy SSR, No 1, 1972, pp 193-195

Abstract: Data are found in the literature indicating that biogenic amines. It was of interest therefore, to study the effect of transamine, an inhibitor of MAO, on the psychoneurologic behavior of rats in relationship to the duration and degree of MAO inhibition. Psychoneurologic behavior was studied by the method of free actions in a T labyrinth. The rats were required to remember the location of an open door on the left or the right branch of the labyrinth. and enzymes participating in their metabolism are involved in the memory process. Unfortunately most studies lack an analysis of the interrelationships of animal behavior and enzyme activity. Furthermore, when considering the inhibitory properties of transamine, the activity of monoamineoxidase, MAO, is often not determined.

MAO activity was determined with the spectrophotometer -- acetylcholinesterase activity by the method of Elman et al.

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USSR

ALEKSIDZE, N. G., et al., Soobshcheniya Akademii Nauk Gruzinskoy SSR, No 1, 1972, pp 193-195

approximately 40 minutes after intraperitoneal injection of transamine, psycho-neurologic behavior of rats deteriorated from 9.17 to 5.30 points, a decrease to 58% of control values. By the second day the memory of the rats had improved but remained significantly depressed at 8.25 points (p greater than .001). Forty-eight hours after the injection of transamine, the ability of rats to solve the labyrinth was essentially normal (8.70; p less than 0.5). In parallel with our studies of the behavior of rats in the labyrinth, we investigated the dynamic activity of MAO in various areas of the cortex and subcortical white matter of the brain. It was discovered that 40 minutes after intraperitoneal injection of transamine, MAO activity is sharply inhibited in all areas of the brain that were studied. MAO remained inhibited in the 24 hour measurement. The degree of inhibition in the cortical and subcortical areas was practically identical at 40 minutes and 24 hours after the injection of transamine. After 48 hours a tendency toward restoration of MAO activity was noted. It is interesting to note that at 72 hours there is significant restoration of MAO activity in the white matter of the frontal, parietal and occipital areas -- tissue composed of primarily glial cells. It is possible that this recovery is one of the characteristics of the laminar coverage of neurons with 2/3

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USSR

ALAKSIDZE, N. G., et al., Soobshcheniya Akademii Nauk Gruzinskoy SSR, No 1, 1972, pp 193-195

glial cells. It should be noted that transamine does not affect acetylcholinesterase activity in the various regions of the rat brain.

Disruption of the behavior of rats in the labyrinth coincided temporally with inhibition of MAO activity. However, 48 hours after the injection of transamine, behavior of rats returned to normal while MAO remained inhibited. In summary, in these experiments with transamine it was not possible to demonstrate a correlation between psychoneurologic behavior and the level of MAO activity in the various areas of the cortex and subcortical white matter of the rat brain.

3/3

USSR

UDC 669.71.48(088.8)

BELETSKIY, G. V., GRAFAS, N. I., KHORYAK, A. K., SHAGALOVA, B. Yu., SHAFARENKO, A.I., and ZVEREV, S. N.

"Device for Extraction of Non-Oxidized Metal From Hot Furnace Skim"

USSR Author's Certificate No 266213, Filed 17/06/68, Published 24/07/70,
(Translated from Referativnyy Zhurnal-Metallurgiya, No 2, 1971, Abstract
No 2 G172 P)

Translation: A device for the extraction of non-oxidized metals from hot furnace skim formed during melting of secondary aluminum alloys is presented. It consists of a cylindrical container with a perforated floor equipped with a mixer located inside the container and rigidly fastened to a vertical shaft. To allow rotation of the floor, it is freely supported on a horizontal, eccentric axis fastened to the walls of the cylindrical container and connected to a vertical member passing through the vertical shaft, which is made hollow, so that it can move.

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USSR

UDC 621.382.2.029.64

PROKHOROV, E.D., BELETSKIY, N.I., DYADCHENKO, A.V.

"Possibilities Of Increasing The High-Frequency Limit Of Gunn Diode Performance"

Radiotekhnika i elektronika, Vol XVII, No 5, May 72, pp 1103-1106

Abstract: It is shown that a voltage of complex form in a Gunn diode or its operation in a multiple-loop [monogokonturnyy] circuit can lead to an increase of the limit of Gunn diode performance and to an increase of the efficiency of the oscillator at frequencies where the effect of scattering of the intervalley electrons is already felt. An approximate analysis is used for this purpose. 3 fig. 6 ref. Received by editors, 17 September 1971.

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USSR

B

UDC 621.382.1.029.6

PROKHOROV, E. D., DYADCHENKO, A. V., SHALAYEV, V. A. and BELETSKIY, N. I.,
Academy of Sciences of the USSR in Moscow

"An Experimental Investigation of the Width of Gunn Diode Voltage-Current
Characteristics"

Moscow, Radiotekhnika i Elektronika, Vol. 15, No. 4, April 1970, pp. 793-796

Abstract: In these experiments, the authors varied the voltage applied to Gunn diodes from a level corresponding to pure Gunn oscillations, through the development of shock ionization in the domain to breakdown. They determined the width of the voltage current characteristic by a formula expounded by Prokhorov, Shalayev, Beletskiy and Arendar' in the previous issue of Radiotekhnika i Elektronika, as a function of the concentration of primary carriers, the field strength outside the domain, the critical strength of the electrical field in the domain (the strength at which zone-zone shock ionization develops) the average maximum drift speed of electrons and the mobility of the primary carriers. Their experimental results fitted the curve calculated by this formula fairly well; they attribute the discrepancies to the approximate determination of primary carrier concentration and mobility. Their results show the voltage current characteristic width to decrease with increasing concentration and decreasing mobility.

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PROKHOROV, et al, Radiotekhnika i Elektronika, Vol 15, No 4, April 1970, pp.793-796

They also investigated recombination radiation in the diodes under various conditions. The spectrum of the radiation detected included a peak and a relatively long tail, indicating a fairly high number of levels at the base of the conductivity zone and the top of the valence zone. At voltage levels up to the width of the voltage current characteristic and somewhat beyond the radiation was proportional to the concentration of shock ionized carriers; with intense radiation beginning at voltages above this width. The radiation intensity increases sharply at higher voltage levels, as breakdown is approached.

At voltage levels near the voltage current characteristic width, the radiation is most intensive at the cathode end, indicating shock ionization as the primary cause; at higher voltages, approaching the breakdown level and beyond it, the radiation is most intense in the center of the diode sample, indicating heating as the primary cause.

Diffusing copper at the anode at a temperature of 400°C for 10-20 minutes increased the resistance of the samples and reduced the characteristic width. The authors explained this seeming contradiction by the fact that the copper compensates some of the doping admixtures in the GaAs, but reduces carrier mobility.

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PROKHOROV, et al, Radiotekhnika i Elektronika, Vol. 15, No. 4, April 1970,
pp. 793-796

The duration of the afterglow was found to increase with increasing voltage from the characteristic width to breakdown. In the experimental samples used, the duration of the radiation increased after breakdown, but its intensity remained constant as the voltage increased. The authors take this as an indication that at temperatures of 100°C and higher the concentration of electrons in their samples did not change.

The authors conclude that shock ionization is the primary determinant of the voltage current characteristic width in Gunn diodes, but that heat breakdown also has an effect.

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1/2 016

UNCLASSIFIED

PROCESSING DATE--16OCT70

TITLE--EXPERIMENTAL INVESTIGATION OF THE WIDTH OF THE CURRENT VOLTAGE
CHARACTERISTICS OF GUNN DIODES -U-

AUTHOR--(04)-PROKHOROV, E.D., DYACHENKO, A.V., SHALAYEV, V.A., BELETKSIY,

N.I.
COUNTRY OF INFO--USSR

B

SOURCE--RADIOTEKHNIKA I ELEKTRONIKA, VOL. 15, APR. 1970, P. 792-796

DATE PUBLISHED-----70

SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--VOLT AMPERE CHARACTERISTIC, GUNN DIODE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1424

STEP NO--UR/0109/70/015/000/0792/0796

CIRC ACCESSION NO--AP0118413

UNCLASSIFIED

2/2 016

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0118413

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. EXPERIMENTAL STUDY OF THE WIDTH OF THE CURRENT VOLTAGE CHARACTERISTICS OF GUNN DIODES AS A FUNCTION OF CARRIER CONCENTRATION, DIODE LENGTH, AND CARRIER MOBILITY. ATTENTION IS GIVEN TO THE RELATION BETWEEN THE WIDTH OF THE CURRENT VOLTAGE CHARACTERISTIC AND RECOMBINATION RADIATION. IT IS SHOWN THAT THE DOMINANT ROLE IN CHANGING THE CURRENT VOLTAGE CURVES OF THE DIODES IS PLAYED BY IMPACT IONIZATION IN A STRONG ELECTRIC FIELD. THE HEATING WHICH LEADS TO DIODE BREAKDOWN AT BOLTAGES EXCEEDING THE WIDTH OF THE CURRENT VOLTAGE CURVE ALSO CAUSES THE DEVELOPMENT OF IMPACT IONIZATION IN A STRONG ELECTRIC FIELD.

UNCLASSIFIED

1/2 035
TITLE--A GRAVITY FLYER -U UNCLASSIFIED PROCESSING DATE--09OCT70

AUTHOR--BELETSKIY, V.

B

COUNTRY OF INFO--USSR

SOURCE--MOSCOW, TEKHNIKA MOLODEZHI, NO 3, 1970, PP 26-27

DATE PUBLISHED-----70

SUBJECT AREAS--SPACE TECHNOLOGY, EARTH SCIENCES AND OCEANOGRAPHY

TOPIC TAGS--GRAVITATION, PROPULSION, ION, PLASMA JET, SPACE FLIGHT, ORBIT
TRAJECTORY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1993/1764

STEP NO--UR/0029/70/000/003/0026/0027

CIRC ACCESSION NO--AP0114253

UNCLASSIFIED

2/2 035 UNCLASSIFIED PROCESSING DATE--09OCT70
CIRC ACCESSION NU--APOLL4263

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A SIMPLER AND LESS COSTLY SUBSTITUTE IS PROPOSED FOR "LOW THRUST" ION AND PLASMA DRIVES FOR ORBITAL TRAVEL, WHEREIN PROPULSION IS TO BE EFFECTED BY GRAVITATION. THE BASIS OF THIS UNIQUE METHOD MAY BE REDUCED TO THREE POINTS: 1) THE GRAVITATIONAL FORCES ACTING UPON A REAL BODY AND UPON A MATERIAL POINT POSSESSING THE SAME MASS DIFFER FROM ONE ANOTHER; 2) CHANGING THE DIMENSIONS AND SHAPE OF THE BODY, THE VALUE OF THE GRAVITATIONAL FORCES ACTING UPON IT CAN BE REGULATED; 3) SKILLFUL USE OF THIS "REGULATION" MAY SUBSTANTIALLY ALTER THE ORBITAL TRAJECTORY. DEPENDING UPON THE GRAVITATIONAL FORCES ACTING UPON A SATELLITE IN ORBIT, THIS METHOD MAY BE USED TO ATTAIN ESCAPE VELOCITY WITHIN A GREATER OR LESS PERIOD OF TIME. THE NECESSITY FOR CHANGE OF DIMENSIONS AND SHAPE MAY BE ELIMINATED IF A LIQUID MASS IS CAUSED TO PULSATE WITHIN THE SATELLITE.

UNCLASSIFIED

Reliability Theory

USSR

UDC: 621.3.019.3:621.3.072.4+621.316.9

BELETSKIV V V

"The Effect of Feedback and Protection Circuits on the Reliability of Electronic Radio Equipment"

Kiev, IVUZ Radioelektronika, Vol 15, No 5, May 72, pp 589-596

Abstract: Problems of improving the parametric reliability of electronic radio equipment by introducing protection circuits and feedback are considered. Formulas are derived for determining the parameters of radio equipment from the condition of guarantee of a given level of reliability. It is shown that for any $T > 0$, where $T = -\beta K$ (β is the feedback factor and K is the transfer constant) in the case of negative feedback, or satisfaction of the condition

$$\frac{-2}{1-M_B/M_K} > T < \frac{-2}{1-(\delta_B/\delta_K)^2}$$

in the case of positive feedback, the stability and parametric reliability of radio equipment can be increased. Here M_B is the mathematical expectation of the error $\Delta\beta/\beta$, M_K is the systematic component of the error $\Delta K/K$,

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USSR

BELETSKIY, V. V., IVUZ Radioelektronika, No 5, May 72, pp 589-596

and δ_B and δ_K are the corresponding random deviation and random component of these errors. The formulas derived in the paper give the required depth of feedback in accordance with the stability level. It is shown that the optimum level of parametric reliability realized by introducing feedback is reached at $T \leq T_0 = (\delta_K/\delta_B)^2$ for oscillator circuits, or $T \geq 0.5 \cdot T_0$ for amplifier circuits if precision elements are used in the feedback circuit. Conditions are determined under which protection circuits ensure parametric reliability.

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USSR

UDC 531.38

BELETSKIY, V. V. and TORZHEVSKIY, A. P., Institute of Applied Mechanics,
Academy of Sciences USSR Moscow

"Stability of High Speed Revolutions of an Axisymmetric Satellite in
Gravitational Field"

Moscow, Doklady Akademii Nauk, SSSR, Vol 203, No 1, Mar-Apr 72, pp 50-53

Abstract: The case of the satellite high speed revolutions about the center of mass, when the frequency of revolutions is much higher than the orbital frequency is analyzed, that is when the kinetic energy of revolutions T highly exceeds the force function U . The analysis is based on the solution of a system of canonic equations with Hamiltonian function, describing the motion of an axisymmetric solid body about the center of mass on a circular orbit, in the Newtonian gravitational field. The R. B. Barrar theorem in a particular formulation is used to substantiate the stability of the satellite precession, according to its geometrical and velocity characteristics.

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USSR

UDC 531.36

BELETSKIY, V. V., NOVIKOVA, YE. T., Moscow

"Spatial Movement of a Pack of Two Bodies in Orbit"

Moscow, Izvestiya Akademii Nauk SSSR, Mekhanika Tverdogo Tela, No 5, 1971, pp 23-28

Abstract: A study was made of the movement of two particles connected by a flexible weightless thread and artificial Earth satellites put into orbit. The orbit of the center of mass of the system is assumed circular. The movement of such a pack of bodies in the orbital plane has been analyzed previously [V. V. Beletskiy, et al., Kosmicheskiye issledovaniya, Vol 7, No 3, 1969; Kosmicheskiye issledovaniya, Vol 7, No 6, 1969]. Here, some results are presented from studying the spatial movement of the bodies. In the general case of spatial movement, the regions of possible movement with a given energy reserve are isolated. The stability of the positions of equilibrium is investigated. In the case of bound movement (that is, movement of a pack of bodies with a tight thread) the regions are found in the phase space inside which the bound nature of the movement is preserved. There are phase trajectories lying wholly in these regions, that is, under defined conditions bound movement can continue indefinitely.

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USSR

BELETSKIY, V. V., et al., Izvestiya Akademii Nauk SSSR, Mekhanika Tverdogo Tela, No 5, 1971, pp 23-28

The discussion includes the equations of motion, the conditions of descent, the energy integral, the regions of possible and impossible movement, analysis of the stability of the positions of equilibrium, and the conditions of bound movement.

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AT9043848 INTERNAT. AEROSPACE ABST. 4-69

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A69-33221

RESULTS OF A DETERMINATION OF ORIENTATION FROM ON-BOARD MEASUREMENT DATA.

V. V. Beletskii, V. V. Goloubkov, E. A. Stepanova, and L. G. Khatskevich (Akademiiia Nauk SSSR, Institut Prikladnoi Matematiki, Moscow, USSR).

IN: ATTITUDE CONTROL AND STABILIZATION OF SATELLITES: CENTRE NATIONAL D'ETUDES SPATIALES, INTERNATIONAL CONFERENCE, PARIS, FRANCE, OCTOBER 8-II, 1968, PROCEEDINGS [EVOLUTION D'ATTITUDE ET STABILISATION DES SATELLITES; CENTRE NATIONAL D'ETUDES SPATIALES, COLLOQUE INTERNATIONAL, PARIS, FRANCE, OCTOBER 8-II, 1968, PROCEEDINGS]. [A69-33219 17-31] Paris, Centre National d'Etudes Spatiales, 1969, p. 25-59. 5 refs. In English and French.

Results of a determination of the orientation of the satellite Proton 2, a determination of the moments of the forces acting on this satellite, and an estimation of the accuracy of the orientation determination. The general statistical method of orientation determination is described, and some results obtained by this method of information data processing are presented.

F. R. L.

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1/2 036 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--ESTIMATE OF THE NATURE OF THE INTERACTION BETWEEN THE AERODYNAMIC
FLOW AND THE SATELLITE ON THE BASIS OF AN ANALYSIS OF THE MOTION OF THE
AUTHOR--BELETSKIY, V.V.

COUNTRY OF INFO--USSR

B

SOURCE--KOSMICHESKIE ISSLEDOVANIA, VOL. 8, MAR-APR. 1970, P. 206-217

DATE PUBLISHED-----70

SUBJECT AREAS--SPACE TECHNOLOGY, PHYSICS

TOPIC TAGS--SATELLITE MOTION, AERODYNAMICS, AERODYNAMIC MOMENT/(U)PROTON 2
UNMANNED LABORATORY

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1994/1742

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PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0115571
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DETERMINATION OF THE AERODYNAMIC
MOMENT ACTING IN ORBITAL FLIGHT ON A SATELLITE HAVING ASYMMETRICALLY
POSITIONED SOLAR CELL PLATFORMS. ASSUMING DIFFUSE SCATTERING OF THE
FLOW, THE EVOLUTION OF THE SATELLITE'S MOTION AROUGN ITS CENTER OF MASS
IS ANALYZED. THE MAIN LONG TERM EFFECTS IN DEVELOPMENT OF THIS MOTION
ARE STRONGLY DEPENDENT ON THE PARAMETERS DESCRIBING THE REFLECTION OF
AIR MOLECULES FROM THE SATELLITE SURFACE. IT IS POSSIBLE TO DETERMINE
THESE PARAMETERS ON THE BASIS OF EXPERIMENTAL DATA FOR THE MOTION OF A
SATELLITE, AND THE RESULTS OF SUCH A STUDY FOR THE CASE OF THE PROTON 2
SATELLITE SHOW THAT THE REFLECTION IS EXTREMELY CLOSE TO THE ABSOLUTELY
INELASTIC CASE. THE PROBABLE MEAN VELOCITY OF THIS REFLECTION IS ABOUT
70 M-SEC, WHICH CORRESPONDS TO AN ACCONODATION COEFFICIENT IS ABOUT
EXACTLY EQUAL TO ONE.

UNCLASSIFIED

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PROCESSING DATE--27NOV70

TITLE--ON THE OPTIMAL PUTTING OF AN ARTIFICIAL EARTH SATELLITE IN THE
GRAVITY STABLE POSITION -U-

AUTHOR--BELETSKIY, V.V.

COUNTRY OF INFO--USSR, FRANCE

B

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SUBJECT AREAS--SPACE TECHNOLOGY, NAVIGATION

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OPTIMIZATION, OPTIMAL AUTOMATIC CONTROL, NONLINEAR CONTROL SYSTEM,
SPACECRAFT ATTITUDE CONTROL

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CIRC ACCESSION NO--AT0138790

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE OPTIMIZING CONTROL PROBLEMS BY BODY ORIENTATION (FOR EXAMPLE, BY THE ARTIFICIAL EARTH SATELLITE). LEADS TO THE CONSIDERATION OF THE CYLINDRICAL PHASE SPACE AND TO THE SYNTHESIS OF THE OPTIMAL CONTROL TRAJECTORIES IN THIS SPACE. IN PARTICULAR, THE CONTROL PROBLEM FOR THE PLANE ROTATING BODY LEADS TO THE NECESSITY OF THE SYNTHESIS ON THE PHASE CYLINDER (INSTEAD OF THE PHASE PLANE). IT CAUSES THE PRINCIPLE PECULIARITIES OF THE PICTURE OF OPTIMAL MOTION PHASE TRAJECTORIES SYNTHESIS. FOR EXAMPLE, THE SUCH POINT SET APPEARS ON THE CYLINDER PHASE SPACE FROM WHICH MORE THAN ONE OPTIMAL TRAJECTORY DIRECTING TO THE GIVEN FINAL STATE OF SYSTEM ARE STARTED. IN THE PLACE CONTROL PROBLEMS INCLUDED IN THIS REPORT THE CORRESPONDING POINT SET REPRESENTS A CERTAIN CURVE ON THE PHASE CYLINDER, SO NAMED "A DIVIDING CURVE". IN THIS PROBLEMS TWO OPTIMAL TRAJECTORIES COME FROM ANY OTHER POINT WHICH DOES NOT LIE ON DIVIDING CURVE. B. FRIEDLAND, P. SARACHIK (1), AND YU. M. PHILIMONOV WERE THE FIRST WHO PAID ATTENTION TO THE PRESENCE OF DIVIDING CURVES IN THE NONLINEAR PROBLEMS OF THE ATTITUDE CONTROL.

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USSR

UDC 536.722:536.63

SHEYNDLIN, A. Ye., BELEVICH, I. S., KOZHEVNIKOV, I. G.

"Study of the Enthalpy and Heat Capacity of Materials Based on Niobium Carbide at High Temperatures"

Moscow, Teplofizika Vysokikh Temperatur, Vol 11, No 1, Jan-Feb 73, pp 88-92.

Abstract: Results are presented from studies of the enthalpy and heat conductivity of niobium carbide with various relationships of Nb and C. Measurements were performed by the method of mixing in the 300-3500° K temperature interval. Equations are given for description of the dependence of enthalpy and heat capacity on temperature. The error in measurement of enthalpy is $\pm 1.5\%$. The authors explain the divergence of their data with the data of earlier authors primarily as a result of differences in free-carbon content of the specimens tested.

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USSR

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SHEYNDLIN, A. YE., BELEVICH, I. S., and KOZHEVNIKOV, I. G., Institute of High Temperatures, Academy of Sciences USSR

"Enthalpy and Specific Heat of Boron Carbide in the 273-2600° K Temperature Range"

Moscow, Teplofizika Vysokikh Temperatur, No 2, 1972, pp 421-423

Abstract: The article describes results of a study of the enthalpy and specific heat of boron carbide by the mixing method. The initial composition of the boron carbide samples was 76.4 percent B_{comb.}, 21.26 percent C_{tot.}, 3.32 percent C_{free} and 2.29 percent impurities (0.71 percent Ca + 0.39 Mg + 0.28 Si + 0.91 percent R₂O₃). An analysis of experimental data shows that boron carbide is characterized by a complex temperature dependence of specific heat and enthalpy. The mean specific heat increases rapidly with a temperature change from room temperature to ~ 1100° K, and its dependence on T in the 1300-1900° K range is close to linear. At T > 2100° K the variation of these properties can be described by an exponent. An additional series of experiments performed to reduce the effect of random measurement errors at

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SHEYNDLIN, A. YE., et al., *Teplofizika Vysokikh Temperatur*, No 2, 1972, pp 421-423.

temperatures above 2100° K, where a significant increase in the specific heat of boron carbide is observed, confirmed the character of the temperature dependence of calorific properties.

Experiments were also staged to determine the melting temperature of boron carbide in a furnace with a graphite heater in a pure argon atmosphere. At temperatures above 2650° K it was found that the samples lost mass, and a change of composition took place in the material. Boron carbide melt thrown into a cold calorimeter congealed in the form of spherules with a smooth surface and a large number of internal pores. Chemical analysis showed that samples heated to 2675° K contain 29.05 percent C_{tot}, and 66.43 percent B; completely fused drops of a sample, 49.61 percent C_{tot}, and 45.26 percent B. The greater part of the impurities is iron, which apparently appeared during the preparation of samples from this very hard carbide. The melting temperature of boron carbide obtained under these conditions is $2713 \pm 20^{\circ}$ K. In some experiments where direct contact of a sample with the graphite was permitted,

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SHEYNDLIN, A. YE., et al., Teplofizika Vysokikh Temperatur, No 2, 1972, pp 421-423

samples melted at a lower temperature equal to 2620° K. Results of chemical analysis and visual observations indicate that dissociation of the material and evaporation of boron take place in boron carbide samples near the melting point, as a result of which the congealed melt represents an extremely porous mass with a significant boron deficiency as compared to the initial composition.

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Veterinary Medicine

USSR

BELEVITSKAYA, Ye. S.

"Informatsiya"

Moscow, Veterinariya, No 6, Jun 1972, pp 123-124

Translation: A session of the Scientific Council for Coordination of Research conducted by various Soviet institutions on aspects of infectious fowl diseases was conducted from 1-3 March in Leningrad at the All Union Scientific Research Institute of Fowl Diseases.

Representatives of the Main Veterinary Administration of the USSR, Ministry of Agriculture, and Ptitseprom SSSR (Poultry-raising Industry) participated in the work of the coordination council, along with leading scientists, directors and scientific associates from institutes, stations and laboratories working in the field of diagnosis and specific prophylaxis of various fowl diseases.

F. S. Kudryavtsev, the director of the chief coordination institution, the All Union Scientific Research Institute of Fowl Diseases, announced the results of scientific research in 1971 on the problem "Development of

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